

Appl. No. : 10/045,580
Filed : October 26, 2001

AMENDMENTS TO THE SPECIFICATION:

Please replace the paragraph beginning on page 5 at line 6 with the following:

Preferably, the height of the fluid column in the sight tube 66 is sensed by an optical sensor(s) 65 ~~(not shown)~~. The optical sensor 65 sends a signal to a programmable controller 75 ~~(not shown)~~, which communicates with various pumps and/or valves in the apparatus. In the simplified schematic of FIGURE 1, a single pump 80 and a single valve 82 are provided in each of the first and second fluid lines 32, 40 between the fluid sources 24, 28 and the vessels 34, 44.

Please replace the paragraph beginning on page 6 at line 3 with the following:

When the fluid level in the vessel 34, 44 is below the neck portion 50 thereof, the precision with which the total volume of fluid in the vessel 34, 44 can be determined is relatively low, due to the relatively large cross-sectional area of the body portion 48 and the limited precision of the optical sensor 65. As the vessel 34, 44 is filled and the fluid level rises into the neck portion 50, however, it is possible to more precisely determine the total volume of fluid in the vessel 34, 44, assuming the volume of the body portion 48 of the vessel 34, 44 is known. Because the cross-sectional area of the neck 50 is relatively small, the fluid level in the neck 50, and thus the height of the fluid column in the sight tube 66, rises or falls significantly as the volume of fluid in the vessel 34, 44 is increased or decreased. As a result, the volume of fluid in the vessel 34, 44 can be sensed more precisely by the optical sensor 65. At the same time, because of the relatively large cross-sectional area of the body 48 of the vessel 34, 44, the total volume of the vessel 34, 44 can be substantial without requiring that the height of the vessel 34, 44 be excessive.

Please replace the paragraph beginning on page 6 at line 17 with the following:

With reference again to FIGURE 1, in operation, the controller 75 opens the valve 82 and activates the pump 80 to pump the first fluid through the first fluid line 32 from the first fluid source 24 to the first vessel 34. The fluid level in the vessel 34 rises through the body 48 of the

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vessel 34 and into the neck 50. As the vessel 34 is filled, the fluid column in the sight tube 66 rises. The optical sensor 65 senses the height of the fluid column in the sight tube 66. When the column reaches a predetermined height indicating that the desired amount of fluid is in the vessel 34, the sensor sends a signal to the controller 75 to close the valve 82 and deactivate the pump 80.

Please replace the paragraph beginning on page 6 at line 25 with the following:

In a similar manner, the controller 75 opens the valve 82 and activates the pump 80 of the second fluid line 40 to pump the second fluid from the second fluid source 28 to the second vessel 44. The fluid level in the second vessel 44 similarly rises through the body 48 of the vessel 44 and into the neck 50. As the vessel 44 is filled, the fluid column in the sight tube 66 rises. The optical sensor 65 senses the height of the fluid column in the sight tube 66. When the column reaches a predetermined height indicating that the desired amount of fluid is in the vessel 44, the sensor 65 sends a signal to the controller 75 to close the valve 82 and deactivate the pump 80.

Please replace the paragraph beginning on page 7 at line 3 with the following:

In the arrangement of FIGURE 1, each of the first and second vessels is connected to a mix chamber 100 or storage chamber by a fluid line 102. The fluid lines 102 are connected to the fluid outlets 56 (see FIGURES 2-3) of the vessels 34, 44. When the vessels 34, 44 are filled to the desired levels (taking into account the amount of fluid in the fluid lines 102 between the vessels 34, 44 and the mix chamber 100), the controller 75 opens a valve 108 in each of the fluid lines 102 and delivers the precisely measured contents of vessels 34, 44 into the mix chamber 100. Depending on the particular arrangement of the apparatus, additional pumps may be necessary to pump the fluids through the fluid lines 102 to the mix chamber.

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Please replace the paragraph beginning on page 8 at line 16 with the following:

Fluid flows out of the lower sight tube port 246 and into the sight tube 250 as the vessel 220 is filled with fluid. The height of the fluid column in the sight tube 250 indicates the level of the fluid in the vessel 220. Preferably, the height of the fluid column in the sight tube 250 is sensed by an optical sensor 249 ~~(not shown)~~, which sends a signal to a programmable controller 251 ~~(not shown)~~. The controller 251 communicates with various pumps and/or valves in the apparatus. In the simplified schematic of FIGURE 5, a single pump 262 and a single valve 264 are provided in each of the fluid lines 218, 222 between the fluid sources 210, 212 and the vessel 220.

Please replace the paragraph beginning on page 9 at line 6 with the following:

With reference to FIGURE 5, in operation, the controller 251 opens the valve 264 and activates the pump 262 to the first fluid through the fluid line 218 from the first fluid source 210 to the vessel 220. The fluid rises into the neck portion 232 of the vessel 220. Because of the relatively small cross-sectional area of the neck portion 232, the fluid level in the neck 232, and thus the height of the fluid column in the sight tube 250, rises significantly as the volume of fluid in the neck 232 is increased. The volume of the first fluid in the neck 232 can thus be precisely determined by the optical sensor 249. When the fluid column reaches a predetermined height indicating that a desired volume of fluid is in the neck portion 232, the sensor 249 sends a signal to the controller 251 to close the valve 264 and deactivate the pump 262.

Please replace the paragraph beginning on page 9 at line 16 with the following:

The controller 251 then opens the valve 264 and activates the pump 262 of the second fluid line 222 to pump the second fluid from the second fluid source 212 to the vessel 220. The fluid level in the vessel 220 rises through the remaining part of the neck 232 and into the body portion 230 of the vessel 220. As the vessel 220 is filled, the fluid column in the sight tube 250 rises. The optical sensor 249 senses the height of the fluid column in the sight 250 tube. When

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the column reaches a predetermined height, the sensor 249 sends a signal to the controller 251 to close the valve 264 and deactivate the pump 262.

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REMARKS

Allowable Subject Matter

The Examiner has noted that Claims 1-12 stand allowed over the prior art of record. Applicants thank the Examiner for noting this allowable subject matter.

Drawing Objections

The Examiner has objected to Figures 1-5 under 37 C.F.R. §1.83(a) as failing to show every feature of the invention specified in the claims. In response, Applicants have amended Figures 1-5 to overcome the Examiner's objections and, also, amended the specification to reflect the Figure amendments. These amendments are fully supported by the specification as filed and do not add new matter.

Specifically, the Examiner has stated that the recited optical sensor, programmable controller, and storage chamber must be shown in the appropriate Figures. In response, Applicants have amended Figure 1 to include a controller 75 and an optical sensor(s) 65. Applicants have also amended Figure 5 to include a controller 251 and an optical sensor 249. Consequently, Applicants have also amended the specification to refer to the foregoing element numbers (*i.e.*, 65, 75, 249, and 251). In addition, the specification has also been amended to teach "a mix chamber 100 *or storage chamber*." Application at p.7, ll. 3-4 (*Emphasis added*). Accordingly, the "storage chamber" is now illustrated by the existing element 100 in Figure 1.

The Examiner has also objected to inconsistencies between the location of tubular conduit 74 (of sight tube 66) in Figure 1 and the location of the lower sight tube port 62 shown in Figures 2-4. In response, Applicants have amended Figures 2-4 so that the locations of lower sight tube port 62 and fluid outlet 56 have been exchanged relative to one another. As a result, the lower sight tube port 62 shown in Figures 2-4 is now in a position which is across from upper sight port 60 and consistent with the location of the tubular conduit 74 shown in Figure 1. Applicants would also like to note that the specification teaches that "FIGURE 1 is a simplified schematic view," so Applicants' specification and claims are not limited to the sight tube location shown in Figure 1. Application at p. 3, ll. 28-29.

In view of the above, Applicants submit that the Examiner's objections to the drawing have been overcome. Accordingly, Applicants submit that the application is now in condition for allowance and respectfully request the same.

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CONCLUSIONS

In view of the foregoing amendments and remarks, Applicants request reconsideration of the drawing objections and respectfully submit that the application is in condition for allowance. If, however, some issue remains that the Examiner feels can be addressed by Examiner's Amendment, the Examiner is cordially invited to call the undersigned for authorization.

Respectfully submitted,

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